BUTELINE™
PLUMBING SYSTEM

Plumbing and Heating Installation Manual

The complete PB-1 Plumbing System

WRAS APPROVED PRODUCT
0510076

MADE IN NEW ZEALAND

www.buteline.com

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Disclaimer

This manual is only a general guide to the Buteline™ Plumbing System and cannot take into account the different circumstances of every application.

The information contained in this manual is provided without any express, statutory or implied warranties. Neither the authors, Buteline, nor its partners or subsidiaries will be held liable for any damages caused or alleged to be caused either directly or indirectly by this manual.

BUTELINE AND ITS COMMITMENT

The Buteline professional Polybutene-1 (PB-1) Plumbing System has won world acclaim for innovation and advanced design. The commitment to excellence continues to be evident with every product shipped from Buteline's manufacturing facility in Auckland, New Zealand.

Changing times demand new materials and new ideas! The challenges encountered in the design and manufacture of the "Plumbing system of the future" are met by the dedicated team at Buteline in a professional and dynamic manner.

Buteline has installed in-house test equipment to give both quality assurance and quality control of production. These facilities combined with a strong commitment to continuing research and development will ensure Buteline remain leaders in PB-1 technology. Our engineers and technical team accept the challenge for future product development.

The Buteline Plumbing System meets all the requirements of the British Standard - BS 7291:2002 and the water regulations advisory scheme - WRAS 0510076.

Buteline - The Professional Plumber's Choice!

The Buteline Plumbing System is covered by extensive worldwide patents.

THE PROVEN RELIABLE PLUMBING SYSTEM

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THE BUTELINE SYSTEM

Buteline has developed a total solution to the need for a safe, integrated and easy to use potable water plumbing and heating system.

The resultant PB-1 system is designed specifically for professional plumbers and has proven to be high quality and economical.

It is strongly recommended that tradesmen use Buteline's total system, i.e. Buteline clamp tools, Buteline PB-1 pipe and clips, and Buteline fittings, to ensure total compatibility of installations. When installed in accordance with recommendations contained herein, the complete system is fully guaranteed by Buteline (see page 46).

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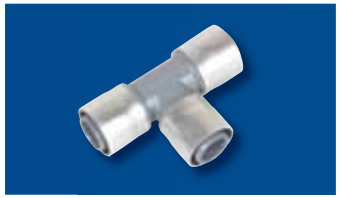
iphe INDUSTRIAL ASSOCIATE

WHY PLUMBERS USE THE BUTELINE PB-1 PLUMBING SYSTEM

- ✓ The Buteline PB-1 System has been designed specifically for use by tradesmen
- ✓ No O-rings
- ✓ No pipe inserts
- ✓ Fittings will not twist once clamped
- ✓ Slim-line design
- ✓ Guaranteed security for 25 years
- ✓ The Buteline PB-1 System has a design concept incorporating factory fitted clamp rings which ensures high productivity.
- ✓ The Buteline clamp tools have been designed and engineered for ease of use, to give long life and a professional result every time. No adjustment required.
- ✓ The Buteline PB-1 System is readily available and stocked by Buteline UK Ltd.
- ✓ The Buteline PB-1 System includes an extensive range of quality useful fittings.
- ✓ The Buteline PB-1 System is competitively priced.
- ✓ Buteline engineers are readily available to assist with technical advice.
- ✓ The Buteline PB-1 System is approved by WRAS for use in potable hot and cold water installations.
- ✓ The Buteline factory fitted metal sleeve provides the strongest reinforced joint available.
- ✓ The Buteline PB-1 Pipe has been coloured grey to identify it as the correct pipe to use for PB-1 potable hot and cold water systems and for re-circulated heating.
- ✓ The Buteline PB-1 System eliminates water hammer noise.

BUTELINE PB-1 PLUMBING SYSTEM

10mm, 16mm, 22mm and 28mm Range



EQUAL TEES
BT10 - 10mm x 10mm x 10mm
BT16 - 16mm x 16mm x 16mm
BT22 - 22mm x 22mm x 22mm
BT28 - 28mm x 28mm x 28mm

REDUCING TEES
BRT112 - 16mm x 16mm x 22mm
BRT211 - 22mm x 16mm x 16mm
BRT212 - 22mm x 16mm x 22mm
BRT221 - 22mm x 22mm x 16mm
BRT828 - 28mm x 22mm x 28mm
BRT881 - 28mm x 28mm x 16mm
BRT882 - 28mm x 28mm x 22mm

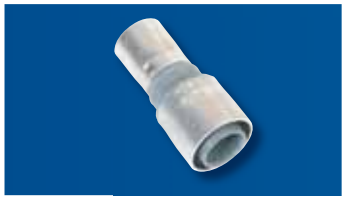
IN LINE COPPER TO PB PIPE TEE
BTC16 - 15mm Cu x 15mm Cu x 16mm

PB PIPE TEE TO 15MM COPPER
BTKP16 - 16mm x 16mm x 15mm Cu

EQUAL CROSSES
BCX40 - 16mm x 16mm x 16mm x 16mm
BCX48 - 22mm x 22mm x 22mm x 22mm

REDUCING CROSSES
BCX42 - 22mm x 22mm x 22mm x 16mm
BCX44 - 22mm x 16mm x 22mm x 16mm
BCX46 - 22mm x 16mm x 16mm x 16mm

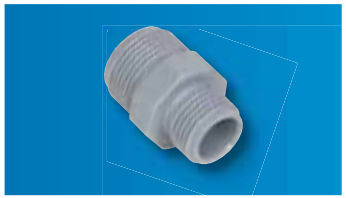
INLINE COUPLINGS
BS10 - 10mm x 10mm
BS16 - 16mm x 16mm
BS22 - 22mm x 22mm
BS28 - 28mm x 28mm



REDUCING COUPLINGS
BS1610 - 16mm x 10mm
BS2216 - 22mm x 16mm
BS2822 - 28mm x 22mm

MALE ADAPTORS
BMP16 - 1/2" BSPT x 16mm
BM316 - 3/4" BSPT x 16mm
BM32 - 3/4" BSPT x 22mm
BM328 - 3/4" BSPT x 28mm
BM128 - 1" BSPT x 28mm

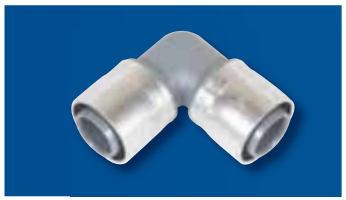
BRASS MALE ADAPTORS
BBM16 - 1/2" BSPT x 16mm
BBM32 - 3/4" BSPT x 22mm



MALE BARREL NIPPLES
B421 - 1/2" BSPT x 1/2" BSPT
B422 - 1/2" BSPT x 3/4" BSPT
B423 - 3/4" BSPT x 3/4" BSPT

TAP CONNECTORS
BF10 - 1/2" BSP x 10mm
BF16 - 1/2" BSP x 16mm
BF31 - 3/4" BSP x 16mm
BF32 - 3/4" BSP x 22mm
BSF328 - 3/4" BSP x 28mm
BSF128 - 1" BSP x 28mm

CHROME RADIATOR VALVE CONNECTOR
BF16C - 1/2" BSP x 16mm
BF10C - 1/2" BSP x 10mm



ELBOWS
BE10 - 10mm x 10mm
BE16 - 16mm x 16mm
BE22 - 22mm x 22mm
BE28 - 28mm x 28mm

REDUCING ELBOW
BER282 - 28mm x 22mm

MALE ELBOWS
BMEP16 - 1/2" BSPT x 16mm
BME328 - 3/4" BSPT x 28mm
BME128 - 1" BSPT x 28mm

MALE/FEMALE EXTENDED ELBOW
BMF60 - Male 1/2" BSP x Female 1/2" BSP

ELBOW TAP CONNECTOR
BEF16 - 1/2" BSP x 16mm
BEF32 - 3/4" BSP x 22mm
BEF328 - 3/4" BSP x 28mm
BEF128 - 1" BSP x 28mm

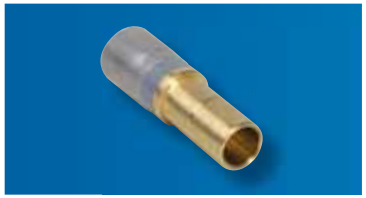
BUTELINE PB-1 PLUMBING SYSTEM

10mm, 16mm, 22mm and 28mm Range

CHROME ELBOW TAP CONNECTOR
BEF16C - 1/2" Cu x 16mm

FEMALE SOLDERING TAIL
BFB16 - 15mm Cu x 16mm
BFB22 - 22mm Cu x 22mm
BFB28 - 28mm Cu x 28mm

COMPRESSION FITTINGS
BMC16 - 16mm Bute PB x 15mm Cu
BMC21 - 16mm Bute PB x 22mm Cu
BMC22 - 22mm Bute PB x 22mm Cu



BUTELINE TO PUSHFIT FITTING
BFP1610 - 16mm Bute x 10mm Pushfit
BFP1615 - 16mm Bute x 15mm Pushfit

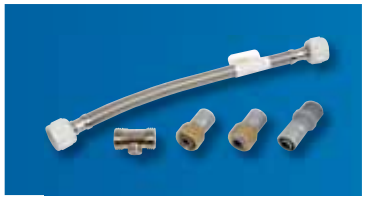
HOSE PLATES
BHP16 - 1/2" BSP x 16mm
BHP22 - 3/4" BSP x 22mm

BUTE1 ADJUSTABLE MALE WALL ELBOW
BUTE1 - 1/2" BSP Male Wall Elbow

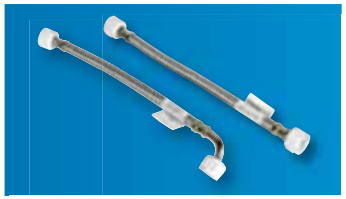
LUGGED ELBOWS
BLE76 - 1/2" BSPT x 16mm x 70mm
BLE106 - 1/2" BSPT x 16mm x 100mm

FEMALE BACK PLATE ELBOW
BEW16 - 1/2" BSP x 16mm
BEW22 - 3/4" BSP x 22mm
BEW31 - 3/4" BSP x 16mm

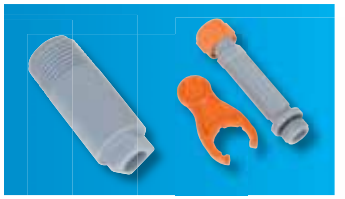
MALE BACK PLATE ELBOW
BWM16 - 1/2" BSPT x 16mm x 65mm
BWM100 - 1/2" BSPT x 16mm x 100mm



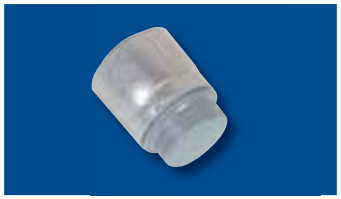
BUTELINE TAP CONNECTING KIT
BTCK12
1 x Straight Flexi Hose
1 x BMP16 Male Adaptor
1 x Isolating Ball Valve
2 x BF16 Tap Connector



FLEXI HOSES
FPE300 - Elbow Flexi Hose 1/2" BSP x 1/2" BSP x 300mm
FPS300 - Straight Flexi Hose 1/2" BSP x 1/2" BSP x 300mm



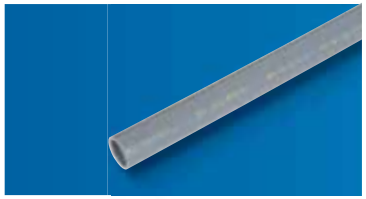
TEST PLUGS
BP15 - 1/2" BSP Extended Test Plug
BPH15 - 1/2" BSPT Test Plug



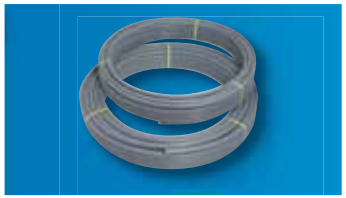
PIPE END PLUGS
BPG10 - 10mm
BPG16 - 16mm
BPG22 - 22mm
BPG28 - 28mm

PIPE CLIPS
BC10 - 10mm
BC16 - 16mm
BC22 - 22mm
BC28 - 28mm

INTERLOCKABLE HINGED PIPE CLIPS
Can be connected together to make multiple clips
BCH16 - 16mm
BCH22 - 22mm
BCH28 - 28mm



PB-I PIPE LENGTHS
BPL316 - 16mm x 3mtr PB-I Barrier Pipe
BPL322 - 22mm x 3mtr PB-I Barrier Pipe
BPL328 - 28mm x 3mtr PB-I Barrier Pipe



PB-I PIPE COILS
BPC10 - 10mm x 1000m coil PB-I Barrier Pipe
BPC56 - 16mm x 50m coil PB-I Barrier Pipe
BPC52 - 22mm x 50m coil PB-I Barrier Pipe

BUTELINE MANIFOLD
BMF3 - 3 port 1/2" BSP outlet 3/4" BSP Female/Male inlet/outlet manifold

BMF4 - 4 port 1/2" BSP outlet 3/4" BSP Female/Male inlet/outlet manifold

BUTELINE PB-1 PLUMBING SYSTEM

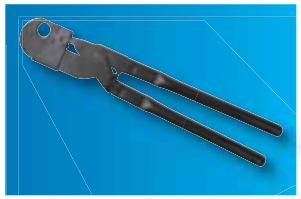
BRASS PLUG
B9120 - 3/4" BSPT
For use with Buteline Manifolds

BRASS CAP NUT
B9102 - 1/2" BSP
For use with Buteline Manifolds

ADDITIONAL BRASS CLAMP RING
BR10 - 10mm
For use with 10mm Microbore System

THREADED TUBE
B9106 - 1/2" BSP x 150mm
B9115 - 3/4" BSP x 150mm

PIPE CUTTER
BPC30 - Spring loaded



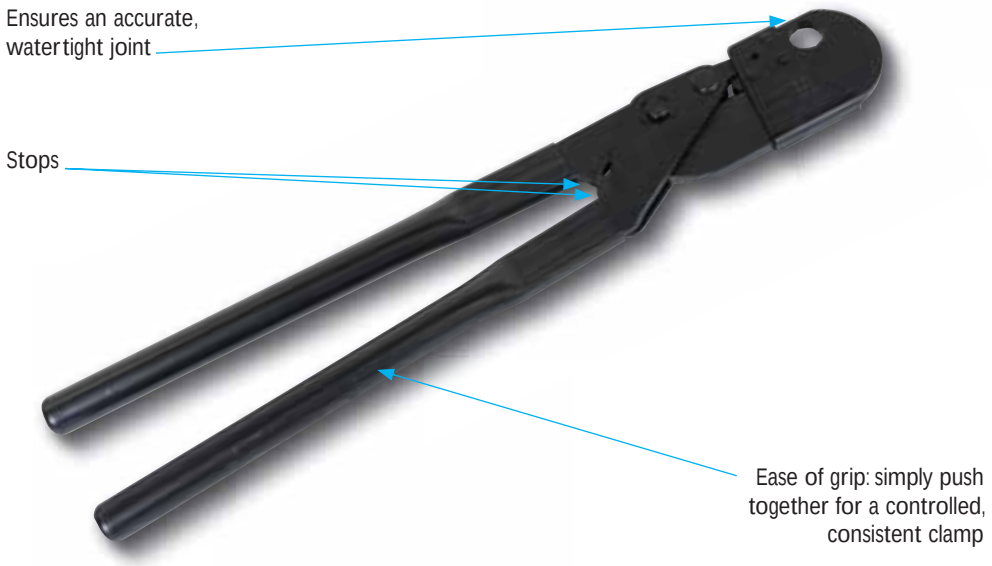
CLAMP TOOL
BFR10 - 10mm
BFR16 - 16mm
BFR22 - 22mm
BFR28 - 28mm

BUTE GETS YOU GOING PACK
GGPI - 2 clamp tools, a pipe cutter, and a selection of the most popular fittings.

For latest product news and updates log onto www.buteline.com (UK site) or feel free to call 0800 043 8883 and request more information and the latest version of this Plumbing & Heating Installation Manual.

BUTELINE CLAMP TOOLS

Buteline have engineered their clamp tool to ensure a simple, controlled, accurate joint every time. This long life quality tool has a "head" design which permits easy access and alignment. The Buteline design needs no "on-site" adjustment and guarantees consistent results. The Buteline Clamp Tool is available in four sizes to suit 10mm, 16mm, 22mm and 28mm Buteline Polybutene-1 pipe fittings.



SERVICING YOUR CLAMP TOOL

Buteline PB-1 Clamp Tools are a very important part of the system. They are extremely robust and designed to perform up to a consistent high standard for many years. Service your clamp tool by cleaning and oiling moving parts regularly. THERE IS NO NEED FOR ADJUSTMENT.

BUTELINE FITTINGS

Buteline have developed an extensive range of quality fittings which have complete compatibility with Buteline Polybutene-1 pipe.

The annealed protective metal sleeve is precisely attached to each fitting during production and is designed to provide a unique metal reinforced joint. Users of Buteline fittings will therefore find the total concept much quicker and more economical than other available systems.

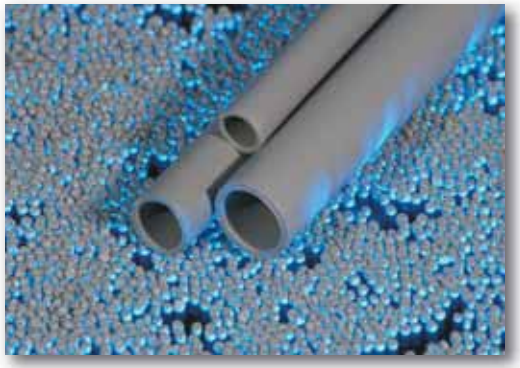
No O-rings or pipe inserts are required

BUTELINE POLYBUTENE-1 PIPE

Buteline Polybutene-1 pipe is produced in 10mm, 16mm, 22mm and 28mm sizes and supplied in 3 metre straight lengths, we can also supply 16mm and 22mm pipe in 50m coils and 10mm pipe in 100m coils.

It is manufactured to meet the exacting British Standard BS 7291:2002 and is fully WRAS Approved. (Buteline Approval No. 0510076).

Buteline Polybutene-1 pipe is approved for use on both hot and cold potable water services as well as heating requirements. Flexible, tough and non-corrosive, Buteline Polybutene-1 pipe can withstand high temperatures and pressures (see Table 1, page 34).



INSTALLATION TECHNIQUE FOR 16mm, 22mm and 28mm

1. Treat Buteline Polybutene-1 installations in a tradesman-like manner.
2. Use the complete "Buteline" System – clamp tools, pipe, fittings, etc.

3. PREPARATION OF PIPE
   (a) Cut the pipe to length squarely and cleanly using only approved pipe cutters.
   (b) Allow enough length for contraction/expansion (minimum 10mm per metre).
   (c) When measuring, allow 15mm of pipe for each fitting.
   (d) Ensure the pipe is clean and free from grease or any other contamination.
   (e) Ensure the pipe has no kinks, buckled sections, deep scores, etc.
   (f) Buteline Polybutene-1 pipe identification marks are printed at 1 metre intervals.

4. POSITION OF FITTINGS
   (a) Fully insert (push home to shoulder) the pipe into Buteline fittings (see figs. 1 & 2, page 13).
   (b) Pre-position fittings correctly on the pipe to achieve alignment with all other pipework prior to final clamping.

(Please refer over leaf for an installation demonstration)

CLAMPING BUTELINE FITTINGS

(a) Position the Buteline clamp tool squarely and approximately 2mm in from the end of the factory fitted reinforcing clamp ring (see fig. 4 on page 14).

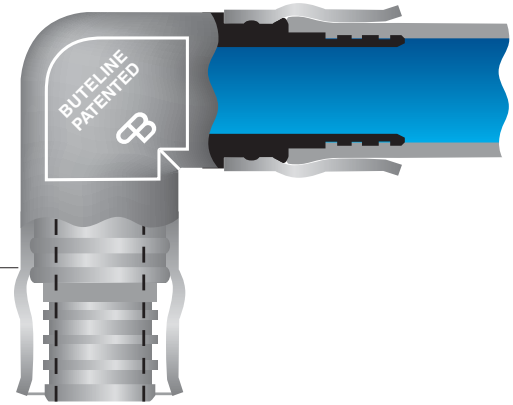
(b) Close clamp tool handles completely to the stops provided. Hold fully closed, then release.

(c) Be methodical and ensure you clamp all fittings on the job.

(d) A good clamp will produce a "flare" at the end of the reinforcing ring (see fig. 5). The "flare" shows that the full clamp width has been applied to the joint - and the designed result achieved. (It is important that a full clamp width is achieved).

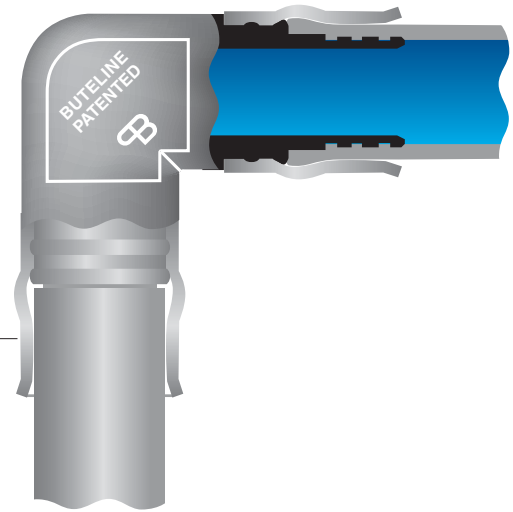
BUTELINE FITTING – CUT-AWAY SHOWING FITTING SHOULDER

Figure 1.



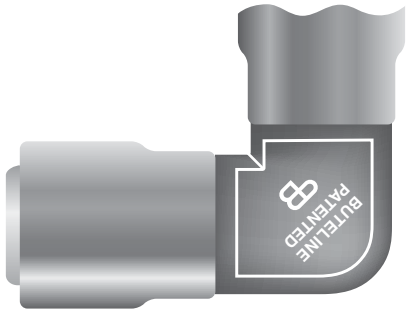
CUT-AWAY SHOWING CORRECT PIPE POSITION IN FITTING

Figure 2.



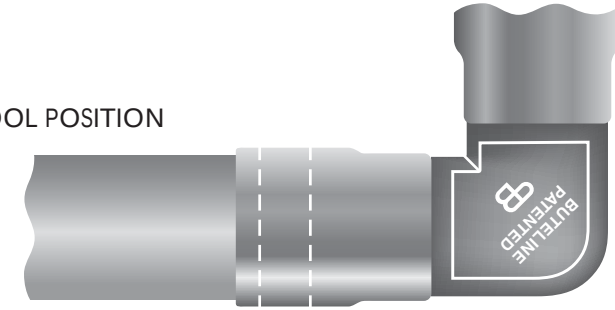
POSITION BUTELINE CLAMP TOOL CORRECTLY

Figure 3.
BUTELINE REINFORCING SLEEVE



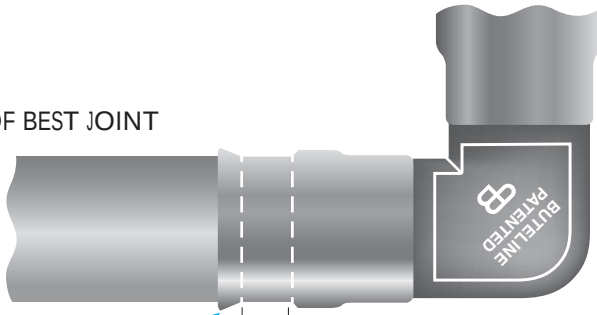
Factory assembled metal sleeve clamp

Figure 4.
CORRECT CLAMPING TOOL POSITION



2mm from end of metal sleeve

Figure 5.
CORRECT APPEARANCE OF BEST JOINT



Flare

Full tool clamp width 8mm

INSTALLING THE BUTELINE SYSTEM

(a) Buteline Polybutene-1 pipe should be installed ensuring any bending radius is at least 10 times the outside diameter of the pipe. Sharp bends should be made with appropriate fittings.

Pipe Size	Minimum Bending Radius
10mm (O.D. 10mm) (Type 10 Class 16)	100mm
16mm (O.D. 16mm) (Type 18 Class 16)	160mm
22mm (O.D. 22mm) (Type 22 Class 16)	220mm
28mm (O.D. 28mm) (Type 28 Class 16)	280mm

(b) Buteline PB-1 installations should have a minimum of 1 metre of copper tube from the hot water cylinder.

(c) Buteline PB-1 pipe should not be installed closer than 150mm to gas or central heating vents, nor located in any confined space containing appliance vents.

(d) "Pipe sleeves" and bored holes should be large enough to allow free movement of Buteline PB-1 pipe.

(e) Buteline PB-1 Hot Water pipe must be supported at least every 600mm by Buteline PB-1 clips, which allows free movement. Pipes unsupported by clips are unsightly and can be damaged.

Polybutene-1 Pipe		
Pipe	Max distance between supports (metres)	
Diameter	Horizontal or Graded Vertical	Vertical
10-16mm	0.60	1.2
20-22mm	0.70	1.4
25-28mm	0.75	1.5

(f) Buteline PB-1 pipe should not be fixed rigidly between two points.

(g) Buteline PB-1 pipe which penetrates fire resistant construction must be installed to ensure the fire resistant integrity of the building is retained (refer to local building code).

(h) If you wish to use the Buteline system outside a normal potable water system, please check with the manufacturer for appropriate recommendations and installation instructions.

(i) Buteline PB-1 pipe should be adequately protected against mechanical damage or any exposure to direct sunlight when located on the exterior of a building (either vertically or horizontally).

NOTE: Take care to keep the Buteline System away from chemicals and solvents.

(j) Use a pipe sleeve when burying Buteline PB-1 pipe in concrete. Pipe sleeves should be large enough to allow free movement of Polybutene-1 pipe. A pipe sleeve is not required when installing a low temperature underfloor heating system (refer to manufacturer).

(k) Buteline PB-1 pipe installed in concrete slabs, footings etc. must have no joints, and must be in accordance with local building codes - be sure to check!

(l) Do not use Polybutene-1 Pipe for "back boiler" to cylinder plumbing.

(m) Do not use Polybutene-1 Pipe for solar heater-to-cylinder plumbing (please check with the manufacturer).

(n) Buteline PB-1 Pipe may be insulated if required (see section on 'Freezing Conditions', page 38).

INSTALLATION PROCESS FOR 16mm, 22mm and 28mm

1. Cut the pipe with the Buteline pipe cutter.

2. Insert the pipe into the fitting

3. Clamp approximately 2mm in from the end of the fitting, close the tool handles completely to the stops provided, and hold firmly for around 2 seconds then release.

4. The process of installing the system is – clean and quick leaving a SECURE JOINT Guaranteed!

INSTALLATION PROCESS FOR 10mm

1. Cut pipe to length squarely and cleanly using the Buteline pipe cutter.

2. Slide the clamp ring onto the end of the pipe until the step in the ring comes against the end of the pipe.

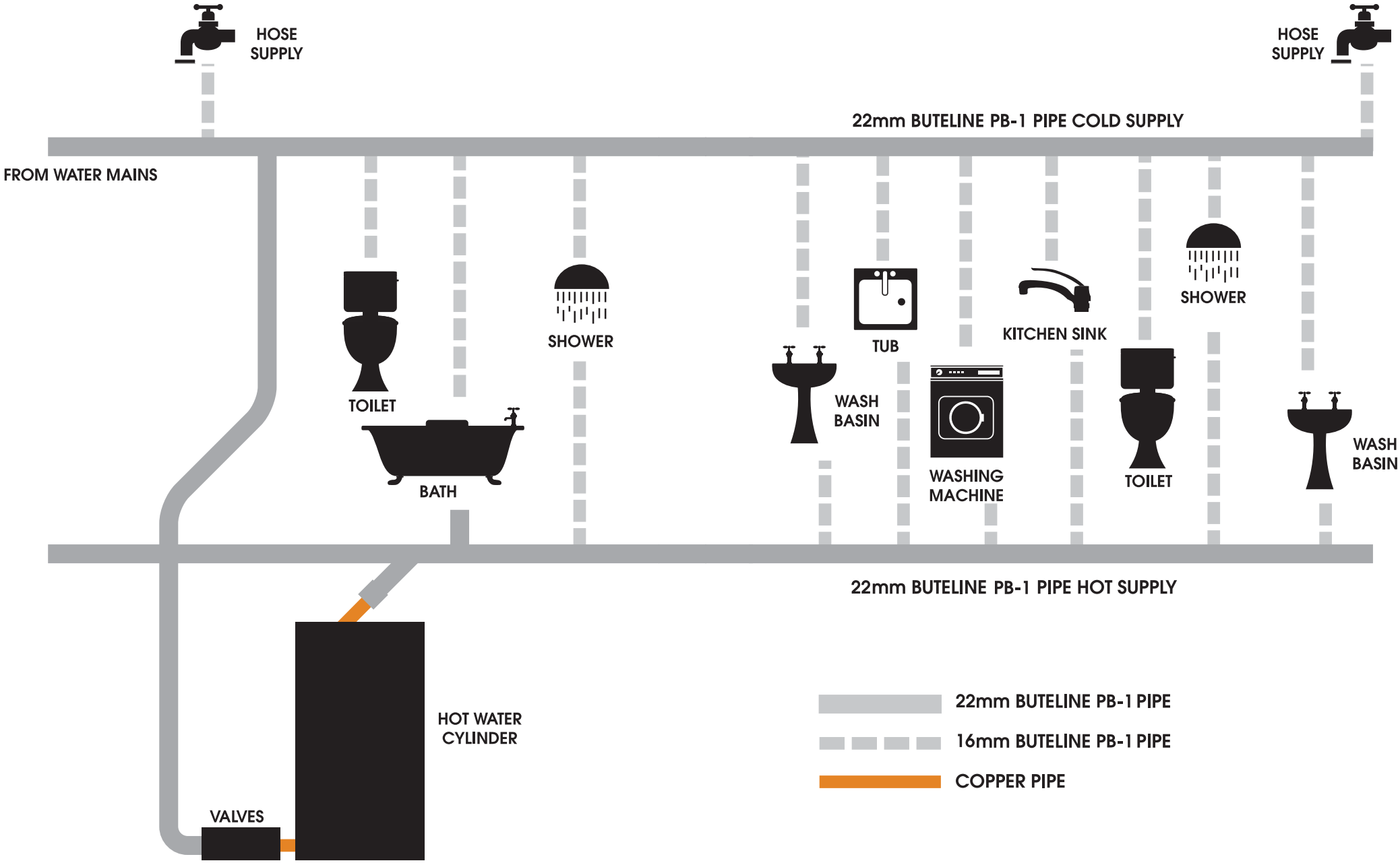
3. Push the tail of the fitting into the end of the pipe so that the shoulder of the fitting butts up against the end of the pipe. Ensure that the fitting is correctly aligned to allow all the connections to be made properly.

4. Position the clamp tool squarely over the clamp ring with the jaws approximately 1mm from the outside end of the clamp ring.

   Close the clamp tool handles completely until the jaws touch and hold closed, then release.

TYPICAL METHOD OF PLUMBING - 16mm and 22mm

USING BUTELINE WATER MAINS AS SHOWN



INSTALLATION OF THE WATER MAINS

(a) New water mains – take Buteline PB-1 22/28mm pipe from water meter to rear of dwelling. This practice will give maximum water flow at all service points (refer to pages 20 & 21).

(b) Trench should be as straight as possible between water meter and house connection.

(c) Position water meter correctly to avoid an 'S' bend in the pipe at the point of connection (see fig. 6 below).

(d) Lay Buteline PB-1 pipe in the bottom of the trench - check that there are no sharp objects that may penetrate or damage the pipe. 'Snake' the pipe the entire length underground to allow for expansion and contraction.

(e) If 'jointing' underground is necessary, wrap the fittings using polythene building tape or similar.

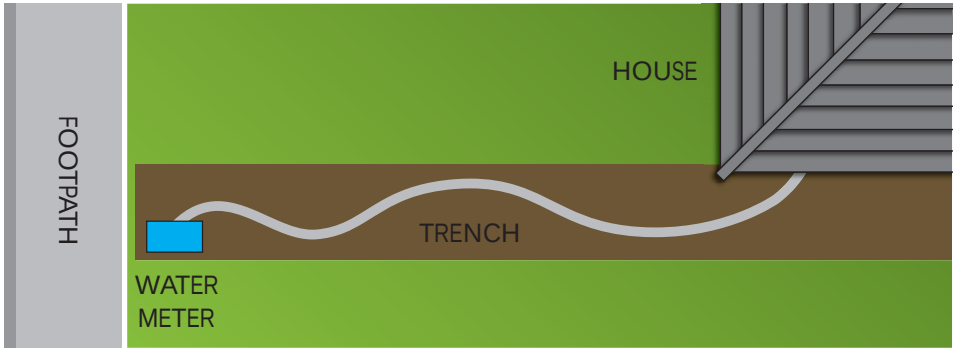
(f) Pressure test before back filling.

(g) Trench depth (refer to Local Authority).

(h) All installations must conform to Plumbing and Drainage Regulations.

SINGLE "SWEPT" BEND TO WATER METER

Figure 6.



"FEEDING" BUTELINE PB-1 PIPE THROUGH TIMBERS

Minimum Hole Sizes:

Use 12mm drills for – 10mm pipe
Use 18mm drills for – 16mm pipe
Use 24mm drills for – 22mm pipe
Use 32mm drills for – 28mm pipe
Larger holes may be required to ease pipe through if changing direction.

Store Buteline pipe away from direct sunlight, heaters and boilers.

Store fittings so that they cannot be damaged by heavy tools, etc. It is a good idea to have a tote box to carry the large range of fittings available.

Remember that Buteline PB-1 Pipe is flexible but must not be "anchored tightly" between two points.

Plan an installation to take advantage of the benefits that only Buteline PB-1 systems offer.

TEST THE INSTALLATION

As with all installations, the Buteline Plumbing System should be tested immediately after installation. Installations should be tested COLD.

(1) 10 bar (150 P.S.I.) for 12 hours or overnight.

OR

(2) 16 bar (220 P.S.I.) for 30 minutes.

It is required to set and test the temperature of the hot water cylinder. Hot water cylinder thermostats should be set a maximum of 60°C as part of the test procedure.

The requirement that thermostats be set to a maximum of 60°C will ensure that modern plumbing materials used today will operate within their limitations.

A high pressure cylinder has a maximum operating temperature of 70°C.

Polybutene-1 pipe has a maximum operating temperature of 80°C at 7.4 bar.

A thermostat set to 60°C can normally achieve temperatures of 67°C.

With a setting of 60°C the hot water system can be maintained within operating requirements and a long service life is expected for the complete plumbing system.

INSTALLATION – SUMMARY AND CHECKLIST

- ✓ Be methodical and check as you go that each joint has been clamped correctly.
- ✓ Check the pipe is clean and in good condition.
- ✓ Check that pipework is “clipped” and supported.
- ✓ Check for expansion and contraction allowance on pipes.
- ✓ Pressure test the system cold at 10 bar (150 P.S.I.) for 12 hours or 15 bar (220 P.S.I.) for 30 mins.
- ✓ Set the thermostat to a maximum of 60°C.
- ✓ Check the hot water temperature.

USE ONLY THE COMPLETE BUTELINE SYSTEM

The use of the complete Buteline System (Buteline Pipe, Buteline Fittings, the Buteline Clamp Tool) is imperative for a number of reasons:

- ✓ Buteline offers a warranty ONLY when the complete Buteline System is used.
- ✓ Buteline Pipe is made to specific tolerances for use with the Buteline fittings to give a strong, leak-proof and PERMANENT joint every time. Only Buteline pipe is manufactured to the exacting standard demanded by the Buteline range of fittings.
- ✓ The exclusive use of the Buteline components ensures a PROFESSIONAL TRADESMAN-LIKE job every time.

The complete Buteline Plumbing System offers the craftsman plumber many advantages, including:

- ✓ The Buteline Clamping Method has proven to be 20% quicker than any other PB-1 Plumbing System available.
- ✓ Buteline produce a large range of useful fittings. (see pages 4 to 8)
- ✓ Buteline's total commitment and total dedication to the Plumbing industry. Buteline will always be the leader in Polybutene-1 Plumbing Systems.
- ✓ The Buteline Plumbing System is designed for the Professional Craftsman Plumber.
- ✓ The Buteline Plumbing System offers sound security with no additional parts incorporated into the system like o-rings/ pipe inserts.

CENTRAL HEATING

Due to the excellent flow characteristics, and the similar sizing to copper piping, no special considerations need to be given to the use of the Buteline System when designing central heating systems. The entire Buteline PB-1 system has been tested to, and approved by WRAS as complying with all the requirements of BS7291:2002 and the system carries a Class S rating.

Please note that generally all the same installation requirements apply to the Buteline Plumbing System when used for central heating systems as to general hot and cold water plumbing systems.

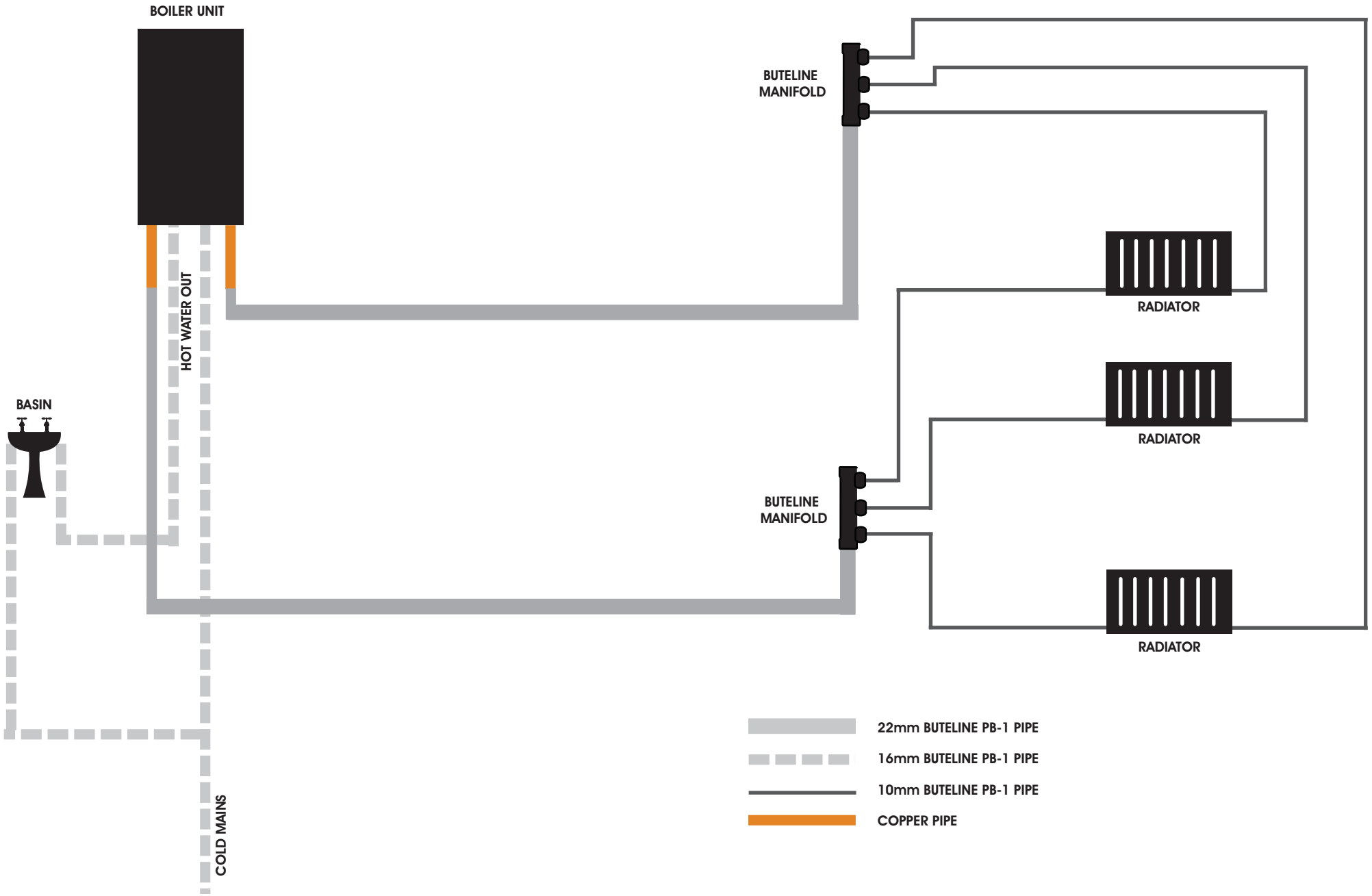
Buteline can be used on the following:

- Mains fed and indirect cold water systems
- Vented and unvented hot water systems
- Vented and sealed central heating installations
- Underfloor heating

When installing direct to a central heating boiler Buteline recommends a minimum of 1m of copper pipe from the boiler unit to allow for conducted residual heat. Unless otherwise stated in the manufacturers installation instructions.

For more information please call Buteline UK Ltd on 0800 043 8883.

TYPICAL METHOD OF INSTALLING A BUTELINE HEATING SYSTEM FOR A COMBINATION BOILER



CONNECTING TO COPPER SOLDER TAIL
STEP-BY-STEP INSTRUCTIONS

Before commencing any work involving heat processes, be sure to check that hot work is permitted.

1. Cut the copper pipe to length, ensuring the end is square. Clean, and apply flux ready for soldering.

2. Slide the solder fitting socket onto the copper pipe, ensuring that the aluminium and plastic clamp ring assembly has been removed.

3. Using suitable lead-free solder, make a solder joint between the fitting and the copper pipe.

4. AFTER the solder joint has COOLED, slide the aluminium clamp ring assembly onto the PB tail of the fitting, ensuring it goes fully up to the fitting shoulder.

5. Simply insert the PB pipe into the Buteline fitting and push fully home to the shoulder of the fitting.

6. Clamp.
   - Clamp the Buteline fitting, using ONLY the Buteline clamp tool.
   - Position the Buteline clamp tool squarely, approximately 2mm in from the end of the clamp ring.
   - Close handles to stops, hold in the tightly closed position for a moment to ensure that the flow of material is performed. Open and remove the tool.

7. Finished.
   - The process is complete!
   - Installing the Buteline System is quick and secure and always provides a visual indicator of joint completion.

CONNECTING TO COPPER COMPRESSION FITTING
STEP-BY-STEP INSTRUCTIONS

1. Cut copper pipe to length, ensuring the end is square and free from burrs.

2. Slide the compression fitting onto the copper pipe, ensuring that the nut and olive are in place.

3. Tighten the compression fitting.

4. Insert the PB pipe fully up to the shoulder of the fitting and clamp using the Buteline clamp tool.
   - Position the Buteline clamp tool squarely, approximately 2mm in from the end of the clamp ring.
   - Close handles to stops, hold in the tightly closed position for a moment to ensure that the flow of material is performed. Open and remove the tool.

5. Finished.
   - The process is complete!
   - Installing the Buteline System is quick and secure and always provides a visual indicator of joint completion.

As you can see, the process of using the Buteline Plumbing System is quick, simple and highly efficient.

WORKING PRESSURE

Buteline Class 16 Pipe — Table 1

Temperature	Pressure		
°C	kPa	P.S.I.	Bar
20	1600	230	16
40	1370	200	13.7
60	1050	160	10.5
80	740	110	7.4
95	490	72	4.9

NOTE:
These pressure/temperature combinations are maximum and should not be exceeded.

Buteline recommends that an expansion valve be incorporated in all high pressure hot water systems.

Table 2

Temp. Pressure Relief Valve	Expansion Valve	Limiting Valve
7.0 Bar	5.5 Bar	3.5 Bar
8.5 Bar	7.0 Bar	3.5 Bar

NOTE:
Hot water storage cylinders with specification ratings of 1000 - 1400 kPa require to be valved as per Table 2.

CONTINUOUS WORKING PRESSURE CLASS 16 PB-1 PIPE

As stipulated in ISO 10508 the lifetime of Polybutene-1 (PB-1) pipe is 50 years and longer according to permissible working pressure/temperature.

Pipe Pressure/ Temperature Rating for Polybutene-1 PB-1 Class 16 (Working Pressures)						
Temperature	20ºC	40ºC	60ºC	70ºC	80ºC	95ºC
PB-1 Class 16	16 Bar	13.7 Bar	10.5 Bar	8.8 Bar	7.4 Bar	4.9 Bar

PRESSURE CONVERSION CHART

(Rounded) Table 3

kPa	Bar	Metre head	P.S.I.
5	0.05	0.5	0.72
10	0.1	1	1.45
20	0.2	2	2.90
30	0.3	3	4.35
40	0.4	4	5.80
50	0.5	5	7.25
60	0.6	6	8.70
70	0.7	7	10.15
80	0.8	8	11.60
90	0.9	9	13.05
100	1.0	10	14.50
200	2.0	20	29.00
300	3.0	30	43.50
400	4.0	40	58.00
500	5.0	50	72.50
1000	10.0	100	145.00

NOTES:

1. 1 metre head = 3.28ft head

2. Additional conversions can be calculated.

e.g. To find 700 kPa in bars or metre head from chart

500 kPa = 5 bar or 50 metre head

+ 200 kPa = 2 bar or 20 metre head

= 700 kPa = 7 bar or 70 metre head

BUTELINE PIPE PRESSURE HEAD LOSS

30 metres pipe (100ft)

Pressure / Head Loss		Per 30 Metres Per 100 Feet		
Minimum Flow Required / Minute		(Class 16) 16mm PIPE	(Class 16) 22mm PIPE	(Class 16) 28mm PIPE
LITRES	GALLONS			
18	4	1 Bar (15 P.S.I.)	0.2 Bar (3 P.S.I.)	0.07 Bar (1 P.S.I.)
22.5	5	1.75 Bar (25 P.S.I.)	0.3 Bar (5 P.S.I.)	0.14 Bar (2 P.S.I.)
27	6	2.8 Bar (40 P.S.I.)	0.4 Bar (6 P.S.I.)	0.175 Bar (2.5 P.S.I.)
31.5	7	4.2 Bar (60 P.S.I.)	0.6 Bar (9 P.S.I.)	0.21 Bar (3 P.S.I.)
36	8	N/A	0.85 Bar (12 P.S.I.)	0.28 Bar (4 P.S.I.)
40	9	N/A	1.0 Bar (15 P.S.I.)	0.35 Bar (5 P.S.I.)
45	10	N/A	1.4 Bar (20 P.S.I.)	0.42 Bar (6 P.S.I.)

NOTE:
Further technical information is available at
www.buteline.com or by calling: 0800 043 8883

FREEZING CONDITIONS

Buteline PB-1 Pipe is the best choice for water reticulation in climates where freezing conditions are possible.

Buteline PB-1 pipe will absorb the expansion of frozen water within itself and will absorb the additional expansion created by the water freezing inside a rigid fitting and expanding into the pipe.

Minimise the problem by taking the following precautions:

- ✓ Make sure that any metal pipe to PB-1 pipe joints are made in a non-freezing area.
- ✓ Ensure 150mm between fittings so that ice expansion from a rigid pipe or joints can be absorbed by the PB-1 pipe.
- ✓ Bury PB-1 pipe where practical.
- ✓ Insulate PB-1 pipe heavily where freezing conditions may prevail.
- ✓ Protect PB-1 pipe from strong winds.
- ✓ Avoid placing PB-1 pipework within 'Polar-facing' walls, where practical.
- ✓ Obviously, although the reticulation system will suffer no long term detrimental effects should it be subjected to freezing conditions, it is not desirable for any reticulated water system to freeze as this will prevent the flow of water. Therefore, to ensure that the water inside Buteline PB-1 pipes is protected from freezing the following precautions should be taken.
- ✓ Buteline PB-1 pipe is by it's nature, flexible, so unlike rigid pipes, can absorb the expansion in volume when water freezes, without splitting. The very small section of the system that are not flexible, the fittings, are protected from freezing damage also, as expanding ice will expand longitudinally through the fitting, and into the pipe where the expansion can be absorbed.
- ✓ Buteline PB-1 pipe is the best choice for water reticulation in climates where freezing conditions are likely to be encountered.

BUTELINE THREADED FITTINGS

(a) It is essential to use pipe thread tape, wrapped correctly, on male thread connectors (such as BMP16, BM316 etc...).

NOTE: This is to ensure adequate protection against leaking and contact with brass or galvanised material.

(b) Ensure that when using a tap connector, the shoulder of the female is presented squarely to a flat machined face before tightening. This avoids crossed threads and ensures a seal.

FREQUENTLY ASKED QUESTIONS

Q: Is the Buteline Product in pack sizes?

A: Most Buteline fittings are in packs of 10 or 25, Buteline Pipe is produced in 16mm, 22mm and 28mm sizes and is supplied in 50mtr coils or 3mtr straight lengths. Buteline now also produces 10mm pipe in 100mtr coils for heating applications.

Q: Can Buteline be installed when a Solar Heating system is used?

A: Buteline cannot be used to connect the solar panels to the hot water storage unit and must only be connected to tempered lines.

Q: Can the Buteline Plumbing System be installed underground?

A: Yes, provided the ground is free of sharp objects which could damage the pipe. If jointing underground is necessary, wrap the fitting rings using PVC tape or similar.

Q: Can Buteline be installed in concrete?

A: Buteline can be installed in concrete providing the pipe is sleeved to allow free movement. Pipe work under concrete must not have any joints and must be in accordance with local Building Codes (plumber to check).

Q: Can Buteline be installed in freezing conditions?

A: The Buteline PB Plumbing system is the best choice in this situation as the PB pipe will absorb the expansion of frozen water within itself.

Q: What is the maximum operation temperature?

A: 95 Degrees Celsius at 4.9 Bar.

Q: What bar pressure can it take and at what temperature?

A: Please refer and memorize the below table for 16mm, 22mm, 28mm systems:

TEMP (^{o}C)	20	40	60	80	95
Available Pressure (Bar)	16.0	13.7	10.5	7.4	4.9

Q: Does the Buteline Plumbing System need to be tested after installation?

A: Only after installation the Buteline Plumbing System requires to be tested at a standard cold temperature at 16 bar for 30 minutes and have no visible signs of leaks.

Q: What material is the Buteline fittings made of?

A: The polymer fittings are made from a high performance thermoplastic (glass-filled polysulphone) the polymer fittings can withstand temperatures up to 135 degrees Celsius and will not corrode. The aluminium is annealed (heat treated) and is also air force grade. The metal fittings are DR Brass.

Q: Does the Buteline warranty / guarantee apply when other manufacturers pipes or fittings are used in conjunction with the Buteline System?

A: No, The Buteline Guarantee covers installation only when the complete Buteline Plumbing System is used – example – pipe, fittings, clamp tools, clips etc, it must also be installed by a registered installer.

Q: What is the maximum bending radius for Buteline PB pipe?

A: Ten times the diameter of the pipe, example – 22mm pipe is 220mm.

Q: How far away from the Hot Water Cylinder can Buteline be connected?

A: Installers are required to have 1m of copper between the heater unit and Buteline.

Q: Can Buteline fittings be reused?

A: No, once clamped the joint is permanent, the product is designed like this so that the installer cannot tamper with fittings and incorrectly install them, a permanent joint leaves you and the customers with peace of mind.

Q: Can other tools be used to clamp the fittings together?

A: No, you must only use the Buteline clamp tool as it is specifically designed for the system.

Q: Can Buteline be installed in direct sunlight?

A: No, Buteline pipe must be painted ideally with water based paint, or if the pipe is sleeved there is no need.

Q: Can you connect Buteline to existing systems?

A: Yes, we have connections to copper or push fit, but we will only guarantee the Buteline product.

Q: Can Buteline be used for central heating and under floor heating?

A: Yes it can, the Buteline plumbing system is for all plumbing and heating installations.

Q: What standards and approvals does the Buteline Plumbing System meet?

A: The Buteline Plumbing System meets all relevant UK approvals:

Water Regulations Advisory Scheme – WRAS 0510076

British Standards - BS 7291:2002

National House Builders Council (NHBC)

DEFINITION OF TERMS

BOILING POINT
The boiling point refers to the temperature at which a liquid changes to vapour by the addition of heat. The boiling point depends on the pressure at which the liquid is held. Boiling point increases as the pressure increases.

CLAMP
To brace, clasp or band for strengthening other materials.
To strengthen or fasten to hold firmly. (Dictionary definition)

CRIMP
To press into pleats or folds. (Dictionary definition)

CONVECTION
Refers to the transfer of heat by means of a flow of fluid (liquid or gaseous form).

Liquid is heated in one place then moved to a place where it can give up its heat.

Natural convection is caused by heating a fluid making it less dense than the surrounding fluid and allowing the heated fluid to rise by displacement.

DEZINCIFICATION
When exposed to water many brasses show deterioration in which the zinc content is gradually removed — leaving a "spongy" copper which can become porous and leak.
Some waters produce this effect very rapidly.

DESIGN STRESS PRESSURE
A design stress pressure is a factor used to calculate test pressure or safe working pressure.

A formula is used which incorporates wall thickness, pipe diameter and material characteristics to determine acceptable pressures i.e. Polybutene-1.

Design stress 1000 P.S.I. = test pressure 240 P.S.I. on 16mm pipe (refer to Pressure Conversion Chart, page 36).

LIMITING VALVE
A pressure limiting valve. A form of pressure reducing valve which automatically reduces inlet water pressure to acceptable limits at the outlet — but only when supply pressure exceeds the pre-set minimum.

POTABLE
Drinkable.

T.P.R. (TEMPERATURE/PRESSURE RELIEF)
A fixed setting combination valve for temperature and pressure relief.

"BACK BOILER"
Water coils behind a domestic fire or cooking range. Any fuel fired unit fitted with a coil or tank system which permits water to heat and flow by convection to a storage cylinder.

THE BUTELINE GUARANTEE

To whom it may concern,

Buteline (UK) Limited guarantees all its products.

The Buteline Plumbing System is guaranteed to be free of manufacturing or material defects for a period of 25 years from the date of sale and that it meets the requirements of WRAS-0510076 and BS7291:2002.

This Guarantee only applies to the products installed by a suitably qualified plumber in accordance with the Buteline Plumbing and Heating Installation Manual.

Where subject as above a claim is made during the guarantee period and products are proven to be defective in materials and or manufacture then Buteline (UK) Limited will supply replacement parts free of charge.This is the exclusive remedy under this Guarantee.

This Guarantee does not affect the statutory rights of a consumer.

BUTELINE UK LIMITED

YOUR IMPORTANT PHONE NUMBERS

Name:	Number:

NOTES:

NOTES:

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